

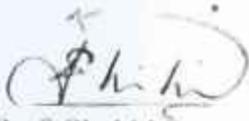
## PROFESSIONAL SECTION

### REGULAR EXAMINATION NOTICE

#### FY & SY SEM-II & IV

All the students of First Year & Second Year (BMS/BAMMC/BScIT/BScDS) are hereby informed that their Semester End Examination for Sem-II & IV (Regular) will be commencing from 27<sup>th</sup> March 2024.

Timetable will be displayed on notice board.



Prof. Shahid Pervez  
Chairman Exam Committee  
Professional Courses



Prof. (Dr.) Hanif Lakdawala  
Asst. Director  
Professional Courses



Prof. (Dr.) Shaukat Ali  
Principal



Note: All questions are compulsory:

Q1. Attempt any THREE from the following:

- A Explain difference Between Data and Information in DBMS.
- B Explain any four types of databases.
- C Explain various models in database with suitable diagram.
- D What is Data abstraction in Database Management System?
- F Explain data model basic building Block with proper diagram.

FYB.Sc (Data Sc) [15]

Q2. Attempt any THREE from the following:

- A What is normalization? What is need of it? Explain.
- B Explain (1NF) First Normal Form with example.
- C Explain (3NF) First Normal Form with example.
- D Write short notes on 4NF and 5NF.
- F Write SQL code to create a table called "Persons" that contains five columns: PersonID, LastName, FirstName, Address, and City and also insert any 5 record of your choice.

[15]

Q3. Attempt any THREE from the following:

- A What is SQL? What it can do?
- B Write down syntax of WHERE clause of select statement with example
- C Explain all SQL aggregate function with example.
- D How to use IN and NOT-IN operator in subquery? Explain with example.
- F What are the different roles of DBA in cloud? Explain in brief.

[15]

Q4. Attempt any THREE from the following:

- A What are the criteria to join two tables? Explain.
- B Explain inner-join with example.
- C Explain right-join with example.
- D Explain database life cycle with proper diagram
- F Write short notes on centralized database management system.

[15]

Q5. Attempt any THREE from the following:

- A Explain ACID property.
- B What is serilizability? Explain in detail.
- C Write short notes on two phase locking protocols.
- D Explain time stamp ordering protocol.
- F Write short notes on indexes.

[15]

Note: All questions are compulsory:

Q1. Attempt any THREE from the following:

[15]

- A Explain vector object in brief.
- B Write and explain default R interface and R console.
- C Explain files , plots , packages and help options in R studio interface.
- D Write a note on R package. Also write how to search the package?
- E Write a note on attributes of R object.
- F Write R program to calculate addition of two numbers using function & return the result.

Q2. Attempt any THREE from the following:

[15]

- A Write the features of R in data science.
- B Write the applications of R in data science.
- C Write the advantage and disadvantage of R.
- D Write and explain the syntax of while loop in R with suitable example.
- E Write and explain the syntax of for loop in R with suitable example.
- F Write R program that calculate area of circle using function by reading the value radius.

Q3. Attempt any THREE from the following:

[15]

- A Explain the different ways to display the contents of variable in R with example.
- B What is readline( ) method? Write and explain the different conversation function in R.
- C Write a short note on a basic data type in R. Also explain these with suitable example.
- D What is function in R? Explain how to create and call a function with suitable example.
- E What is vector in R? Explain how to create and display the vector with suitable example.
- F Write R Program to create list of fruit containing 5 element & display them using for loop.

Q4. Attempt any THREE from the following:

[15]

- A What is list in R? Explain how a list is created and display its element.
- B Write and explain how to add and change an item in the list.
- C What is a matrix? Explain how a matrix is created with suitable example.
- D What is an array? Explain how an array is created with suitable example.
- E Explain with example how to draw a bar chart.
- F Write R program that create list of number from 30-60 and display using for loop.

Q5. Attempt any THREE from the following:

[15]

- A Explain plot() function to plot 5 points with labels to x and y axes.
- B Explain pie chart with label and header.
- C Write a short note on scatter plot with example.
- D Write and explain how to use color, size and shape of a point in plot( ) function.
- E Explain plot() function to draw a line of 20 points with main label.
- F Write R program that read three strings and concatenate the strings using function.

Note: All questions are compulsory:

<b>Q1. Attempt any THREE from the following:</b>		<b>[15]</b>
A	What do natural resources entail, and can you differentiate between renewable and non-renewable ones? Could you rephrase this inquiry?	
B	Describe the functioning of an ecosystem using your own explanation.	
C	Explain the significance of studying the environment.	
D	Illustrates the flow of energy within an ecosystem visually.	
E	Examine the different categories of environmental change.	
F	What are the consequences of air pollution on human health and the environment?	
<b>Q2. Attempt any THREE from the following:</b>		<b>[15]</b>
A	What is the significance of biodiversity on a global scale?	
B	Detail the methodology for conducting a pollution case study in a specific region and elucidate the principles of disaster management.	
C	Describe how individuals can contribute to preventing pollution and discuss the feasibility of their efforts.	
D	Define social water management and elaborate on its principles and practices.	
E	Define pollution in your own terms and elucidate the factors contributing to its occurrence.	
F	What are the benefits of practicing the 3 R's (Reduce, Reuse, and Recycle) in waste management?	
<b>Q3. Attempt any THREE from the following:</b>		<b>[15]</b>
A	Discuss the intersection of human rights and education within a 500-word framework.	
B	Outline the methods employed for the resettlement and rehabilitation of individuals impacted by pollution.	
C	Identify urban challenges and propose strategies for addressing issues related to water conservation.	
D	Define the concept of sustainable development and elaborate on its principles and objectives.	
E	Describe environmental protection using your own explanation.	
F	How does deforestation affect wildlife habitats and biodiversity?	
<b>Q4. Attempt any THREE from the following:</b>		<b>[15]</b>
A	Elaborate on the significance of fostering strong relationships between home, school, and the environment.	
B	What methods would you employ to gather information about the local environment to educate your students about its biodiversity and ecosystem?	
C	Examine the attributes of the lecture teaching method in environmental science, highlighting its Advantage and Disadvantage.	
D	Evaluate the benefits and drawbacks of employing the supervised teaching approach in environmental science education.	
E	Discuss the effectiveness of the socialized recitation method in teaching environmental science.	
F	Can you name three renewable sources of energy commonly used to reduce carbon emissions?	
<b>Q5. Attempt any THREE from the following:</b>		<b>[15]</b>
A	List the essential equipment required for a school library and specify the diverse environmental studies resources, including books, for instructional purposes.	
B	What strategies can teachers employ to encourage students to engage with library books and develop a reading habit?	
C	Discuss the essential attributes of an effective environmental teacher in the context of the statement "Teacher is the maker of man." A) Individual qualities. B) Professional qualities C) Social qualities.	
D	Enumerate the key qualities required for a commerce teacher to make a significant impact on students.	
E	Discuss the qualities and qualifications necessary for an effective environmental teacher.	
F	What are some simple steps students can take to contribute to environmental sustainability in their daily lives?	

- Note : 1) All questions are compulsory.  
 2) Figures to the right indicate marks.  
 3) Mixing of sub-questions is not allowed and try to accommodate whole QP in single page.

Q1. Attempt any THREE: [15]

- a) A function is given by  
 $F(x) = x+3$  for  $0 \leq x \leq 1$   
 $F(x) = 2x+5$  for  $1 \leq x < 3$   
 $F(x) = 5x+4$  for  $2 \leq x < 3$   
 $F(x) = 0$  otherwise  
 Find  $f(0)$ ,  $f(1.5)$ ,  $f(2)$  and  $f(4)$ .
- b) Explain derivatives and its standard function.
- c) Differentiate the following with respect to  $x$  find  $dy/dx$ .  
 1)  $Y=x^{1/2}$  2)  $y=x^2$
- d) Find  $F'$  if  $f(x) = 1-x/2+x$ .
- e) If  $y=(3x+7)\sqrt{x}$  find  $dy/dx$ .
- f) Differentiate the following with respect to  $x$  when  $y=e^x+2/3x^2+1$ .

Q2. Attempt any THREE: [15]

- a) Evaluate the following definite integrals.  
 $\int_1^4 (5x^2-8x+5) dx$
- b) Explain list of integral formulas.
- c) Let  $A$  be the area of region that lies under the graph of  $f(x)=e^{-x}$  between  $x=8$  and  $x=2$ .  
 Using right endpoints, find expression for  $A$  limit.
- d) Find  $\int_2^3 (2t^2-1)^2 dt$ .
- e) Evaluate the definite integrals :  $\int 1/x\sqrt{x} dx$ .
- f) Find  $\int_1^2 (1+3t)t^2 dt$ .

Q3. Attempt any THREE: [15]

- a) Let  $f(x) = (3/37760) x^2(20-x)$  if  $2 \leq x \leq 18$  determine the mean value of  $x$ .
- b) Solve the integral that gives the volume of the region about the  $x$ -axis?  
 $Y=0, y=16-x^2$ .
- c) If  $r$  is the region bounded above by the graph of the function  $f(x)=x+y$  and below the graph of the function  $g(x)= 3-x/2$  over the interval  $[1,4]$  find the area of the region  $R$ .
- d) What is the value of the function  $(x-1)(x-2)^2$ .
- e) Area between curve determine the area below  $f(x)=3+2x-x^2$  and above  $x$  axis?
- f) If  $r$  is the region bounded above by the graph of the function Find  $f(x)=x/2+5$  and below the graph of the function  $g(x)=x+1/2$  over the interval  $[1,5]$  find the area of the region  $R$ .

Q4. Attempt any THREE:

[15]

- Use Fubini's theorem to compute the double integral  $\iint_R f(x,y) dA$  where  $f(x,y) = x$  and  $R = [0,2] \times [0,1]$ .
- Evaluate  $\int_2^3 \int_{-1}^4 \int_1^0 4x^2y - z^3 dz dy dx$ .
- Explain 3-D Coordinate system.
- Evaluate  $\iiint_E 12y - 8x dV$  where  $E$  is the region behind  $y = 10 - 2z$  and in front of the region in the  $xz$ -plane bounded by  $z = 2x$ ,  $z = 5$ , and  $x = 0$ .
- Evaluate  $\iiint_B 8xyz dV$   $B = [2,3] \times [1,2] \times [0,1]$ .
- Let's return to the function  $f(x,y) = 3x^2 - y$  from region  $R = [0,2] \times [0,3]$ . Use Fubini's theorem to evaluate  $\iint_R f(x,y) dA$  in two different ways.

Q5. Attempt any THREE:

[15]

- Find the partial derivative of  $f(x,y) = x^2y + \sin x + \cos y$ .
- Find the separate equation of lines i.e.  $x^2 + xy - 12y^2 = 0$ .
- Find the equations of the straight lines bisecting the angles between the pairs of straight lines:  $12x^2 - 7xy - 12y^2 = 0$ ;  $71x^2 + 94xy - 71y^2 = 0$ ;  $x^2 - y^2 = 0$ .
- Find equation of the angles bisectors between the lines  $3x + 4y - 5 = 0$  and  $12x + 5y - 7 = 0$ .
- Find what straight lines are represented by the following equation and determine the angles between them.  
 $x^2 - 7xy + 12y^2 = 0$
- Find  $df/dx$ ,  $df/dy$  for the given function,  $f(x,y,z) = x \cos z + x^2y^3e^z$

\*\*\*\*\* ALL THE BEST \*\*\*\*\*

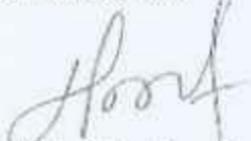
## Time Table - F. Y. B. Sc. (Data Sc) Semester-II (Regular) March-2024

Sr. No.	Date	Day	Name of the Subjects	Time	Duration
1	27-03-2024	Wednesday	Probability and Distributions	11:30 am to 02:00 pm	2 ½ Hrs
2	28-03-2024	Thursday	DBMS ✓	11:30 am to 02:00 pm	2 ½ Hrs
3	30-03-2024	Saturday	R Programming ✓	11:30 am to 02:00 pm	2 ½ Hrs
4	01-04-2024	Monday	Environmental Science ✓	11:30 am to 02:00 pm	2 ½ Hrs
5	02-04-2024	Tuesday	Calculus ✓	11:30 am to 02:00 pm	2 ½ Hrs

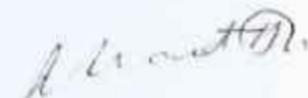
- Note:
- 1) Students without valid I-Card are not allowed to sit for the Semester End Examination.
  - 2) Seating arrangement will be displayed later on notice board.
  - 3) Mobile phones are not allowed in the examination hall.



Prof. Shahid Pervez  
Chairman, Exam Comm.  
Professional Courses



Prof. (Dr.) Hanif Lakdawala  
Asst. Director  
Professional Courses



Prof. (Dr.) Shaukat Ali  
Principal

